

National Grid SA-COA **PRODUCTION FILE**

Contractor : ABB Contracting Co.





Project : SS 8709- 132/13.8kV in Alkharj City

Contract No : 11131113/00

Substation : 8709

**Subject : 132kV Bus Coupler-A +R130
Relay Panel**

ABB

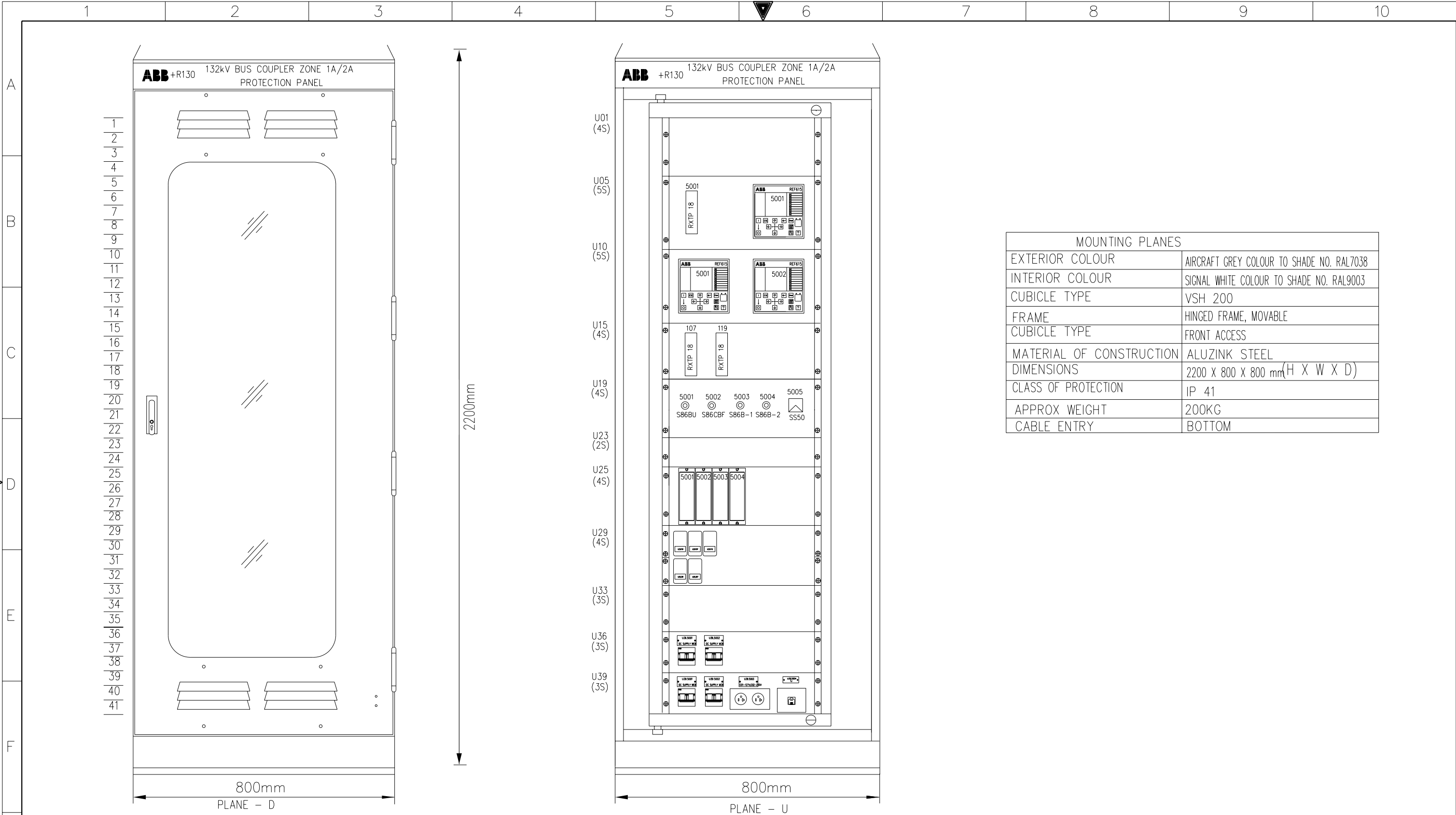
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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A																																																																																																																																						
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C	CONTRACTOR : ABB Contracting Company																																																																																																																																													
	CLIENT : National Gridsa																																																																																																																																													
D	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY																																																																																																																																													
	SUBSTATION : S/S 8709																																																																																																																																													
E	CONTRACT NO. : 11131113/00																																																																																																																																													
	TITLE : Assembly Drawing – +R130 [BUS COUPLER]																																																																																																																																													
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NG/D2-D (2012/01)

DMS

VECTOR

NGD200




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01	13 49	FACTORY ASBUILT FOR APPROVAL		DRAWN BY RIZ CHECKED BY JKR			
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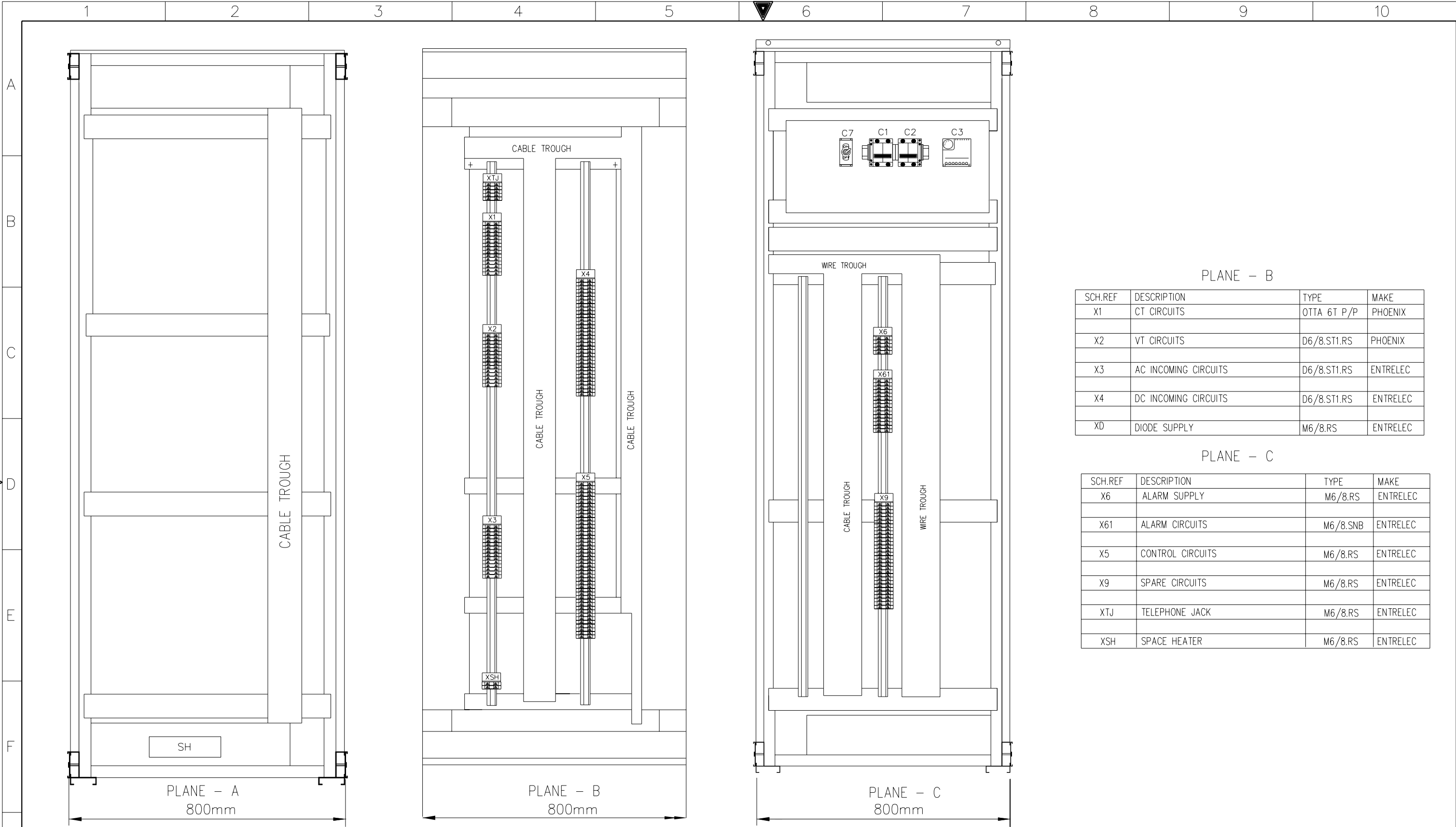
ASSEMBLY DRAWING					
132kV BUS COUPLER ZONE 1A/2A +R130					
S/S 8709-132/13.8KV IN AL-KHARJ CITY					
RIYADH SAUDI ARABIA					

الشركة الوطنية لنقل الكهرباء



National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
-	C421	CD-322945	SHT	CONT.	01
			G01	G02	



PLANE – B

SCH.REF	DESCRIPTION	TYPE	MAKE
X1	CT CIRCUITS	OTTA 6T P/P	PHOENIX
X2	VT CIRCUITS	D6/8.ST1.RS	PHOENIX
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
XD	DIODE SUPPLY	M6/8.RS	ENTRELEC


PLANE – C

SCH.REF	DESCRIPTION	TYPE	MAKE
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC
X5	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X9	SPARE CIRCUITS	M6/8.RS	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

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S/S 8709-132/13.8KV IN AL-KHARJ CITY					
RIYADH SAUDI ARABIA					

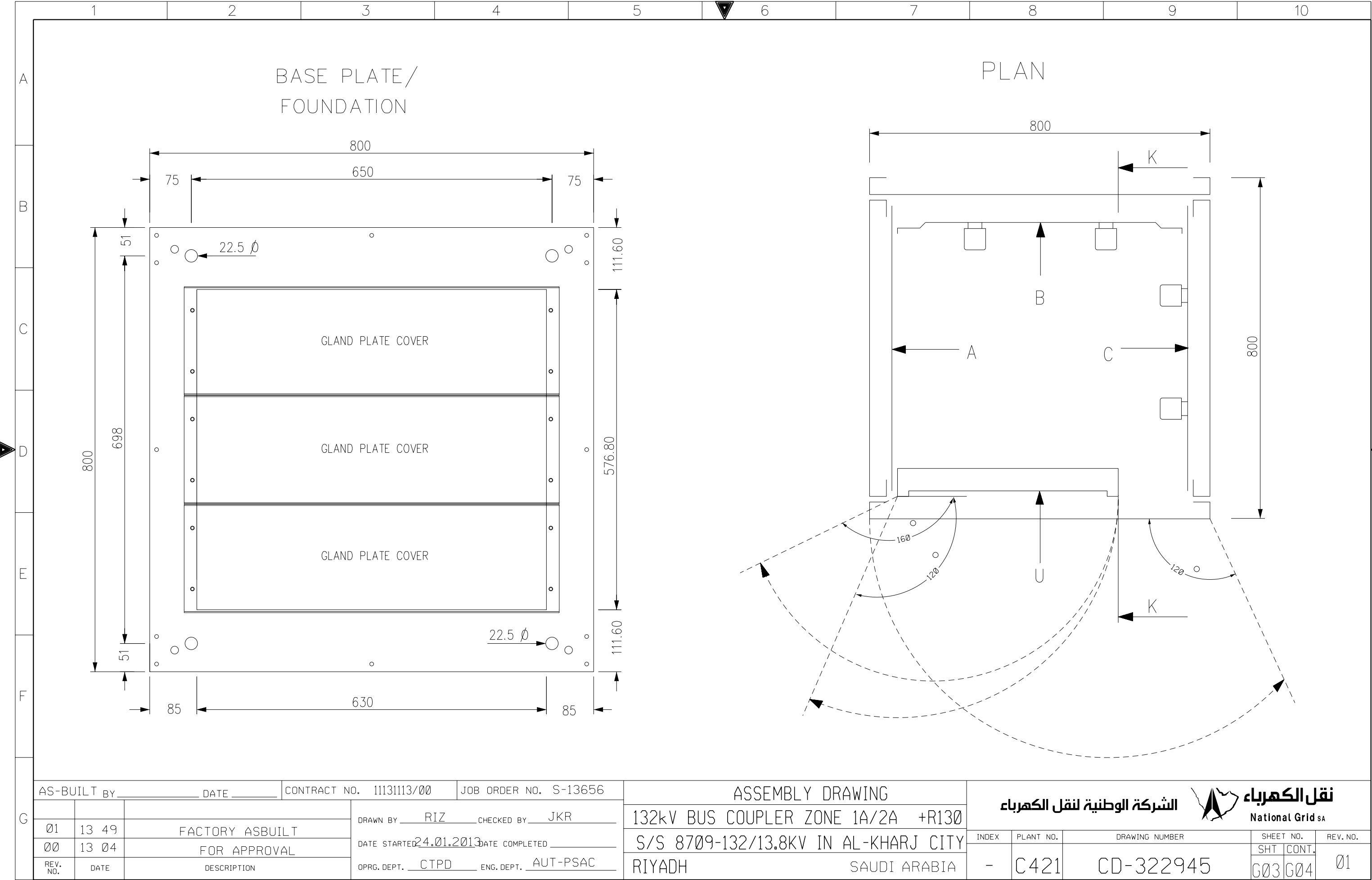
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				National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.	
-	C421	CD-322945		SHT	CONT.
				G02	G03
				01	

NG/D2-D (2012/01)

DMS

VECTOR

NGD200



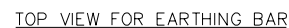




MANUFACTURING LABEL

ABB		ABB Automation Co.Ltd.
PROJECT	:	National Grid SA S/S 8709
ORDER REFERENCE	:	2875 RF S13656
YEAR OF MANUFACTURE:		2013
PANEL NO.	:	+R130
DRAWING NO.	:	S13656-CD-322946
MADE IN THE KINGDOM OF SAUDI ARABIA		

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		<div><div>نقل الكهرباء</div><div>National Grid sa</div></div> <div><div>الشركة الوطنية لنقل الكهرباء</div></div>					
			DRAWN BY _____ RIZ _____ CHECKED BY _____ JKR		132kV BUS COUPLER ZONE 1A/2A +R130									
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SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N	SHT.	QTY.	TYPE	MAKE	ORDER INFORMATION	ORGIN OF COUNTRY
5	U19.5001	S86BC	PUSH BUTTON BLACK COLOUR, WITH 1NO+1NC CONTACTS FOR RESET OF LOCKOUT RELAY (86BU)	234	1	MP1-10B MCBH-20	ABB	1SFA 611 100 R1006 1SFA 611 605 R1102	SWEDEN
6	U19.5002	S86CBF	PUSH BUTTON BLACK COLOUR, WITH 1NO+1NC CONTACTS FOR RESET OF LOCKOUT RELAY (86CBF)	276	1	MP1-10B MCBH-20	ABB	1SFA 611 100 R1006 1SFA 611 605 R1102	SWEDEN
7	U19.5003	S86B-1	PUSH BUTTON BLACK COLOUR, WITH 1NO+1NC CONTACTS FOR RESET OF LOCKOUT RELAY (86B-1)	276	1	MP1-10B MCBH-20	ABB	1SFA 611 100 R1006 1SFA 611 605 R1102	SWEDEN
8	U19.5004	S86B-2	PUSH BUTTON BLACK COLOUR, WITH 1NO+1NC CONTACTS FOR RESET OF LOCKOUT RELAY (86B-2)	277	1	MP1-10B MCBH-20	ABB	1SFA 611 100 R1006 1SFA 611 605 R1102	SWEDEN
9	U19.5005	SS50	SELECTOR SWITCH, 2 POSITIONS, 4 STACKS. FOR INST. PROTECTION IN/OUT SELECTION	234	1	R20 2/4 ELECTRIC	COM	R193L-204-27-07-04-20322	
10	U25.5001	86BC	TRIP UNIT (86BU) COMPRISING OF: TRIPPING RELAY : HIGH BURDEN TYPE AUX.VOLTAGE : 110-125V DC CONTACTS : 8NO + 2NC FLAGING : STANDARD HAND RESET CONTACT MECHANISM : HAND&ELECTRICALLY-RESET	234	1	MVAJ105	ALSTOM	MVAJ105 RA0802A	UK
11	U25.5002	86CBF	TRIP UNIT (86CBF) COMPRISING OF: TRIPPING RELAY : HIGH BURDEN TYPE AUX.VOLTAGE : 110-125V DC CONTACTS : 8NO + 2NC FLAGING : STANDARD HAND RESET CONTACT MECHANISM : HAND&ELECTRICALLY-RESET	276	1	MVAJ105	ALSTOM	MVAJ105 RA0802A	UK
12	U25.5003	86B-1	TRIP UNIT (86B-1) COMPRISING OF: TRIPPING RELAY : HIGH BURDEN TYPE AUX.VOLTAGE : 110-125V DC CONTACTS : 8NO + 2NC FLAGING : STANDARD HAND RESET CONTACT MECHANISM : HAND&ELECTRICALLY-RESET	276	1	MVAJ105	ALSTOM	MVAJ105 RA0802A	UK
13	U25.5004	86B-2	TRIP UNIT (86B-2) COMPRISING OF: TRIPPING RELAY : HIGH BURDEN TYPE AUX.VOLTAGE : 110-125V DC CONTACTS : 8NO + 2NC FLAGING : STANDARD HAND RESET CONTACT MECHANISM : HAND&ELECTRICALLY-RESET	277	1	MVAJ105	ALSTOM	MVAJ105 RA0802A	UK

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A	SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N		SHT.	QTY.	TYPE	MAKE	ORDERING INFORMATION	ORGIN OF COUNTRY
	14	U29.101	74R1/74RS	DUAL TARGET RELAY REVERSE FLAG " R1 & RS DC SUPPLY FAIL"		234	1	RXSF 1	ABB	RK 271 019-AN	SWEDEN
				CONTACT DATA : 1NO + 2NC PER COIL							
B	15	U29.301	TMR/86B-1	DELAY FOR PICKUP RELAY		276	1	RXKL1	ABB	1MRK 000 066-AB	SWEDEN
				AUXILIARY VOLTAGE : 24-250V DC							
				CONTACT DATA : 2C/O							
C	16	U29.107	TMR/86B-2	DELAY FOR PICKUP RELAY		277	1	RXKL1	ABB	1MRK 000 066-AB	SWEDEN
				AUXILIARY VOLTAGE : 24-250V DC							
				CONTACT DATA : 2C/O							
D	17	U29.113	R1	RESISTOR UNIT FOR TCS		291	2	RXTMA1	ABB	RK 711 008-AF	SWEDEN
	U29.307	R2	RESISTOR WATT : 0.5-1.0 W ,10 OHMS		292						
E											
F											
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>		
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132kV BUS COUPLER ZONE 1A/2A +R130				
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	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA				

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DMS VECTOR NGD200

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	SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N		SHT.	QTY.	TYPE	MAKE	ORDERING INFORMATION	ORGIN OF COUNTRY			
B	26		X1	BLOT CONNECTING TERMINAL BLOCKS DISCONNECTIBLE FOR CT CIRCUITS		301	20	OTTA 6T P/P	PHOENIX	0790462	GERMANY			
			X2	SPRING LOADED TERMINAL BLOCKS DISCONNECTIBLE FOR VT CIRCUITS		301	15	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
			X3	SPRING LOADED TERMINAL BLOCKS DISCONNECTIBLE FOR AC CIRCUITS		301	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
			X4	SPRING LOADED TERMINAL BLOCK FOR DC EXT. CIRCUITS		301	25	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
			X5	SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS		301	68	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	FRANCE			
			X6	SPRING LOADED TERMINAL BLOCK FOR ALM CIRCUITS		301	5	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	FRANCE			
C			X61	KNIFE TYPE TERMINAL BLOCKS DISCONNECTIBLE FOR STN.-COM ALARM CIRCUITS		301	20	M6/8.SNB	ENTRELEC	1SNA 115 688 R2500	FRANCE			
			XTJ	SPRING LOADED TERMINAL BLOCK FOR TELEPHONE JACK		301	4	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	FRANCE			
			XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER		301	2	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	FRANCE			
			X9	SPRING LOADED TERMINAL BLOCK FOR SPARE		301	20	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	FRANCE			
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	REV. NO.	DATE	DESCRIPTION																																																																							

LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
C1	C1 127V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C2	C2 220V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C3	C3 THERMOSTAT	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C7	C7 ON/OFF SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
DS	DS DOOR SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
IL	IL ILLUMINATION LAMP	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
SH	SH SPACE HEATER	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm

132kV BUS COUPLER ZONE 1A/2A +R130			S/S 8709-132/13.8KV IN AL-KHARJ CITY			RIYADH			SAUDI ARABIA		
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-	C421	CD-322945	L07	---	01
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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD. 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A																																																								
B																																																																
C																																																																
D	CONTRACTOR : ABB Contracting Company																																																															
	CLIENT : National Gridsa																																																															
	PROJECT : CONSTRUCTION OF NEW 132/13.8kv SS 8709 IN AL-KHARJ CITY																																																															
	SUBSTATION : S/S 8709																																																															
E	CONTRACT NO. : 11131113/00																																																															
	TITLE : Schematic Drawing +R130 [BUS COUPLER-A]																																																															
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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET			 نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa																																																						
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NG/D2-D (2012/01)

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













































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CONTENTS		ABB SHT.NO.	REV.00	REV.01	REV.02	REV.03
COVER SHEET		000	X	X		
CONTENTS SHEET		001	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS		011	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS		012	X	X		
COMMON LEGEND		013	X	X		
FERRULE AND WIRING DETAILS		014	X	X		
PRIMARY SYSTEM		051	X	X		
AC SUPPLY FOR ILLUMINATION & POWER SOCKET		211	X	X		
AUXLIARY CONTACTS		212	X	X		
DC SUPPLY DISTRIBUTION		216	X	X		
CT CIRCUITS – 51/51N/50/50N –1RELAY		221	X	X		
VT CIRCUITS BUS–1A & 2A UNDER VOLTAGE CIRCUIT		222	X	X		
51/51N/50/50N BINARY INPUTS		231	X	X		
27B–1A BINARY INPUTS		232	X	X		
27B–2A BINARY INPUTS		233	X	X		
B/U O/C & E/F PROTN. TRIP RELAY CIRCUIT		234	X	X		
CBF–1/2 & BUSBAR PROTN.–1 TRIP RELAY CKT		276	X	X		
BUSBAR PROTN.–2 TRIP RELAY CKT		277	X	X		
CBF–1/2 INITIATION CIRCUIT		278	X	X		
TRIP CIRCUIT–1 SUPERVISION CIRCUIT		291	X	X		
TRIP CIRCUIT–2 SUPERVISION CIRCUIT		292	X	X		
CB CLOSE BLK CIRCUIT		293	X	X		
STN–COMMON ALARM CIRCUIT		294	X	X		
SPARE CONTACTS		295	X	X		

CONTENTS		ABB SHT.NO.	REV.00	REV.01	REV.02	REV.03
BLOCK REFERENCE		298	X	X		
BLOCK REFERENCE		299	X	X		
TERMINAL BLOCK REFERENCE +R120		301	X	X		

1		2		3		4		5		6		7		8		9		10	
A B C D E F	SYMBOL		DESCRIPTION		SYMBOL		DESCRIPTION		SYMBOL		DESCRIPTION								
			FRAME CONNECTION				MAIN CONTACT OF A CIRCUIT BREAKER				RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING								
			EARTH CONNECTION				PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE				RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS								
			RESISTOR				BREAK CONTACT DELAYED WHEN OPERATING												
			VARIABLE RESISTOR				MAKE CONTACT DELAYED WHEN RELEASING				SIGNALLING LAMP								
			RESISTOR WITH PRESET ADJUSTMENT				TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION				MECHANICAL INDICATOR WITH AUTOMATIC RESET								
			CAPACITOR				JUNCTION OF MECHANICAL LINKS				MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET								
			SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE				AUTOMATIC RESET				ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET								
			OPEN CONTACT, MAKE CONTACT				NON-AUTOMATIC RESET				ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET								
			CLOSED CONTACT, BREAK CONTACT				SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET				RELAY WITH MAKE CONTACT								
			CHANGE-OVER CONTACT, BREAK BEFORE MAKE				SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET				RELAY WITH CHANGE-OVER CONTACT								
			MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING				CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION				ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION								
			BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING				RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING				ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITION								
			SWITCHING DEVICE WITH MANUAL CONTROL				RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING				BELL, BUZZER								
			MAKE CONTACT DELAYED WHEN OPERATING				RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING				SIREN , HORN								
			BREAK CONTACT DELAYED WHEN RELEASING																
			MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING																
			MAIN CONTACT OF A SWITCH DISCONNECTOR																
			MAIN CONTACT OF A DISCONNECTOR																
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		GRAPHICAL SYMBOLS FOR DIAGRAMS		الشركة الوطنية لنقل الكهرباء National Grid sa										
					DRAWN BY RIZ CHECKED BY JKR		132kV BUS COUPLER ZONE 1A/2A +R130		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.						
	01	13 49	FACTORY ASBUILT		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY		-	C421	CD-322946	SHT 011	CONT. 012						
	00	13 04	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA						01						
	REV. NO.	DATE	DESCRIPTION																

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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FUSE / LINK		WATTMETER		ELEMENT WITH NEGATED INHIBITING INPUT
	FUSE WITH THE SUPPLY SIDE INDICATED		VARMETER		ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION
	SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)		POWER FACTOR METER		ELEMENT WITH POSTPONED OUTPUT
	SINGLE-PHASE TRANSFORMER WITH THREE SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)		POSITION INDICATOR		AND-ELEMENT WITH TWO INPUTS
	SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC CORE		SYNCHROSCOPE		OR-ELEMENT WITH TWO INPUTS
	SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		RECORDING VOLTMETER		LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2
	SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		RECORDING WATTMETER		ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2"
	CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		HOUR METER		EXCLUSIVE OR-ELEMENT WITH THREE INPUTS
	CURRENT TRANSFORMER WITH TWO CORES (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		WATT-HOUR METER		LOGIC IDENTITY ELEMENT WITH THREE INPUTS
	CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM		MAJORITY ELEMENT WITH THREE INPUTS
	FILTER		ELEMENT WITH STATIC INPUT		NEGATOR
	HIGH-PASS FILTER		ELEMENT WITH STATIC NEGATED INPUT		NAND ELEMENT WITH TWO INPUTS
	BAND-PASS FILTER		ELEMENT WITH STATIC NEGATED OUTPUT		NOR ELEMENT WITH TWO INPUTS
	VOLTMETER		ELEMENT WITH DYNAMIC INPUT		BISTABLE ELEMENT
	AMMETER		ELEMENT WITH DYNAMIC NEGATED INPUT		
			ELEMENT WITH INHIBITING INPUT		

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY JKR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

GRAPHICAL SYMBOLS FOR DIAGRAMS

132kV BUS COUPLER ZONE 1A/2A +R130




S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322946	SHT 012	CONT. 013
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LEGENDS

±R1

±R2

±R3

±IT

FL

BB RS±

BB CBF± /CBF±

R

CR

ECC

LOCAL

REMOTE

ON

OFF

A

T

S

CS

CT

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LT

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LO

RO

DC SUPPLY – MAIN PROTECTION

DC SUPPLY – SECONDARY PROTECTION

DC SUPPLY – BACK UP PROTECTION

DC SUPPLY – INTER TRIP

DC SUPPLY – FLASHING CIRCUIT

DC SUPPLY – BUS BAR – PROTECTION RESET

DC SUPPLY – CBF PROTECTION

RESET BUS – ALARM SYSTEM

CONTROL ROOM

ENERGY CONTROL CENTRE

THE LOCATION OF CONTROLLED DEVICE

ANY OTHER LOCATION NOT LOCAL

CB NORMALLY OPEN AUXILIARY CONTACT

CB NORMALLY CLOSED AUXILIARY CONTACT

COMMON

TEST POSITION

SERVICE POSITION

CLOSE IN SERVICE POSITION

CLOSE IN TEST POSITION

LOCAL SERVICE

LOCAL TEST

LOCAL CLOSE

LOCAL OPEN

REMOTE OPEN

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE
2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS
2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS
1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS
1.5 SQ.mm. BLUE COLOURED FOR COMMON ALARM SIGNALS
2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS
2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS
FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:
+ SIGN FOR DC + WIRE
– SIGN FOR DC – WIRE

LUGS

A. CT CIRCUITS– RING TYPE
B. OTHER CIRCUITS – SPADE TYPE

FERULLING

YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES (AS PER 31 – TMSS–1, RE.0)

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NG/D2-D (2012/01)

DMS

VECTOR

NGD200

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E										
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G										
FOR 132kV RELAY & CONTROL, PROTN. PANELS										
AS PER IEC-391 FIG 14a (W/O SUPPLEMENTARY/IDENTIFICATION MARK)										
FOR 132kV PANELS INTERPANEL WIRING										
AS PER IEC-391 FIG 14d (W/O SUPPLEMENTARY/IDENTIFICATION MARK)										
WIRES – PVC insulated,stranded, coiled annealed copper conductor graded for 1000V										
LUGS – Pre-Insulated										
a. CT Circuits – 2.5 Sqmm PVC Yellow colour										
b. VT Circuits – 2 Sqmm PVC Red colour										
c. DC, & CONTROL Circuits – 1.5 Sqmm PVC Grey colour										
d. Alarm Circuits – 1.5 Sqmm PVC Blue colour										
e. AVC & AC Circuits – 2.5 Sqmm PVC Black colour										
f. Earth Circuits – 2.5 Sqmm PVC Yellow/Green colour										
a(CT Circuits – Ring type										
b(Other Circuits – Spade type										
NOTE:1 ADDITIONAL MARKING AS APPLICABLE										
NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE 3.2 mm for 1.5 sq mm wires and 4.2 mm for 2.5 sq mm wires (As per 31-TMSS-1, REV 0)										
NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT										
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656										
FERRULE AND WIRING DETAILS										
132kV BUS COUPLER ZONE 1A/2A +R130										
S/S 8709-132/13.8KV IN AL-KHARJ CITY										
RIYADH SAUDI ARABIA										
الشركة الوطنية لنقل الكهرباء National Grid SA										
INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.										
- C421 CD-322946 014 015 01										
NG/D2-D (2012/01) NGD200										

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A		<div><div><div>ABB</div><div>PROTECTION & SUBSTATION AUTOMATION</div></div></div>																		MANUFACTURER		SCHEMATICS DWG.NO		PANEL DESCRIPTION				PANEL REFERENCE	
B																				CD-322928		132/13.8kV GT-1 RELAY PANEL -1 132/13.8kV GT-1 RELAY PANEL -2		SS 8709 132kV RELAY PANELS		+R05.1			
+R05.2																													
C																				CD-322931		132/13.8kV GT-2 RELAY PANEL -1 132/13.8kV GT-2 RELAY PANEL -2		+R01.1					
+R01.2																													
D																				CD-322934		132/13.8kV GT-3 RELAY PANEL -1 132/13.8kV GT-3 RELAY PANEL -2		+R04.1					
+R04.2																													
E																				CD-322936		132/13.8kV TRANSFORMER-1,2& 3 AVC PANEL		+AVC					
F																				CD-322922		132KV SPARE-1 UGF RELAY PANEL -1 132KV SPARE-1 UGF RELAY PANEL -2		+R07.1					
																								+R07.2					
																				CD-322916		132KV 8020 UGF RELAY PANEL -1 132KV 8020 UGF RELAY PANEL -2		+R02.1					
																								+R02.2					
																				CD-322919		132KV 8710 UGF RELAY PANEL -1 132KV 8710 UGF RELAY PANEL -2		+R03.1					
																								+R03.2					
																				CD-322925		132KV SPARE-2 UGF RELAY PANEL -1 132KV SPARE-2 UGF RELAY PANEL -2		+R06.1					
																								+R06.2					
																				CD-323012		132KV FOIP PANEL		+FOIP					
																				CD-322946		132kV BUS COUPLER-A		+R130					
																				CD-322948		132kV BUS COUPLER-B		+R230					
																				CD-322950		132kV BUS SECTION		+R120					
		CD-322991		132kV BUSBAR PROTECTION MAIN-1 CENTRAL UNIT PANEL		+BB1-1																							
		CD-322993		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL		+BB1-2																							
		CD-322995		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL		+BB1-3																							
		CD-322997		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL		+BB1-4																							
		CD-322999		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL		+BB1-5																							
		CD-323001		132kV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL		+BB2-1																							
		CD-323003		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL		+BB2-2																							
		CD-323005		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL		+BB2-3																							
		CD-323007		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL		+BB2-4																							
		CD-323009		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL		+BB2-5																							
G		AS-BUILT BY _____ DATE _____				CONTRACT NO. 11131113/00				JOB ORDER NO. S-13656				DRAWING REFERENCES				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div><div><div></div><div>National Grid sa</div></div></div></div></div>											
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PROTECTION & SUBSTATION
AUTOMATION



الشركة الوطنية لنقل الكهرباء

National Grid SA

SHEET NO.		REV. NO.	
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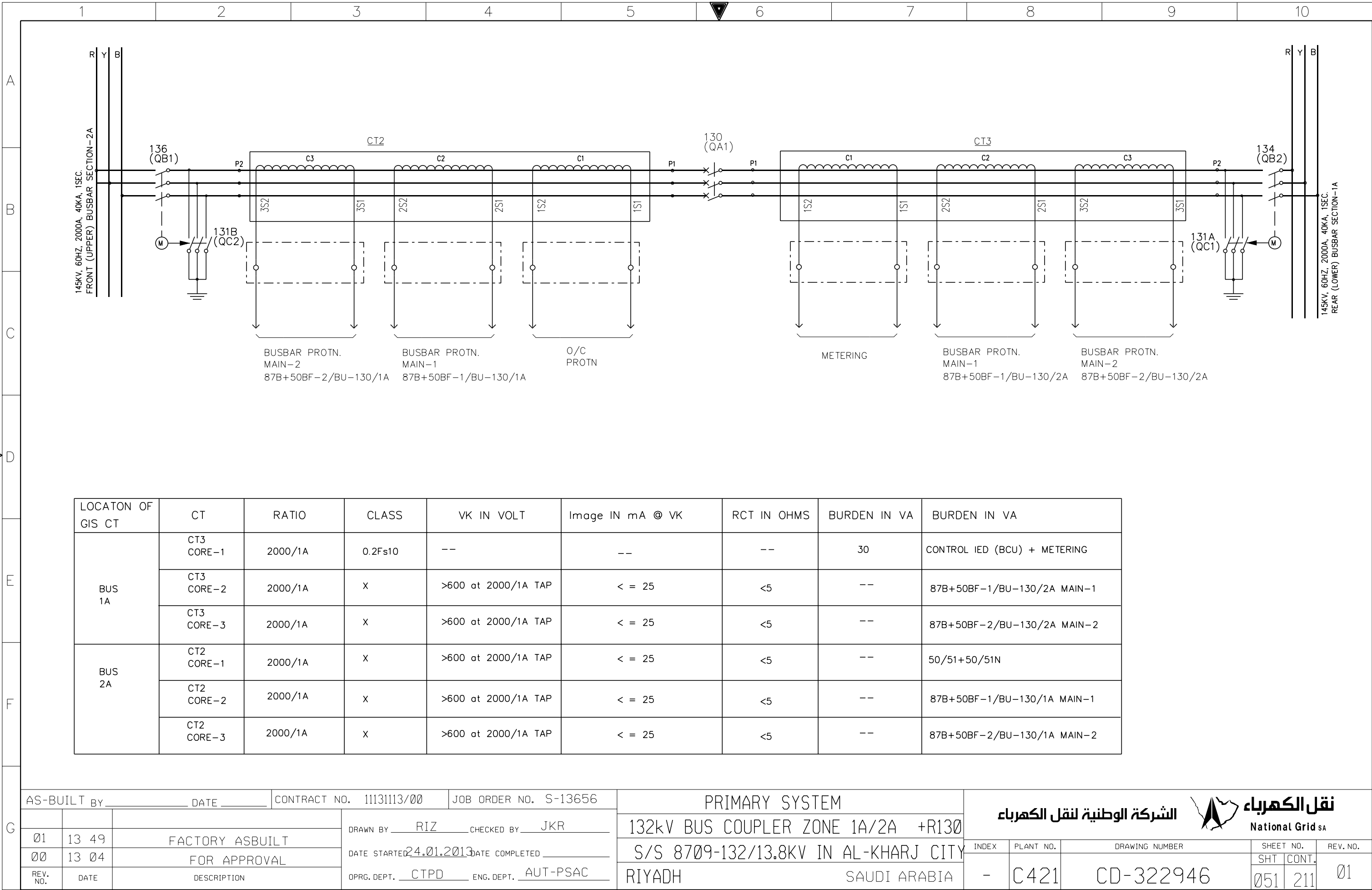
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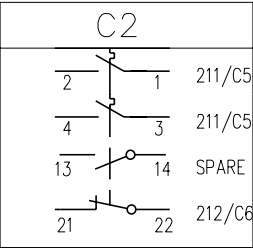
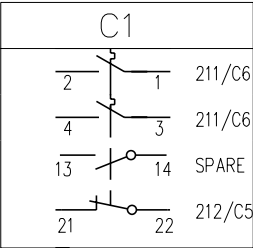
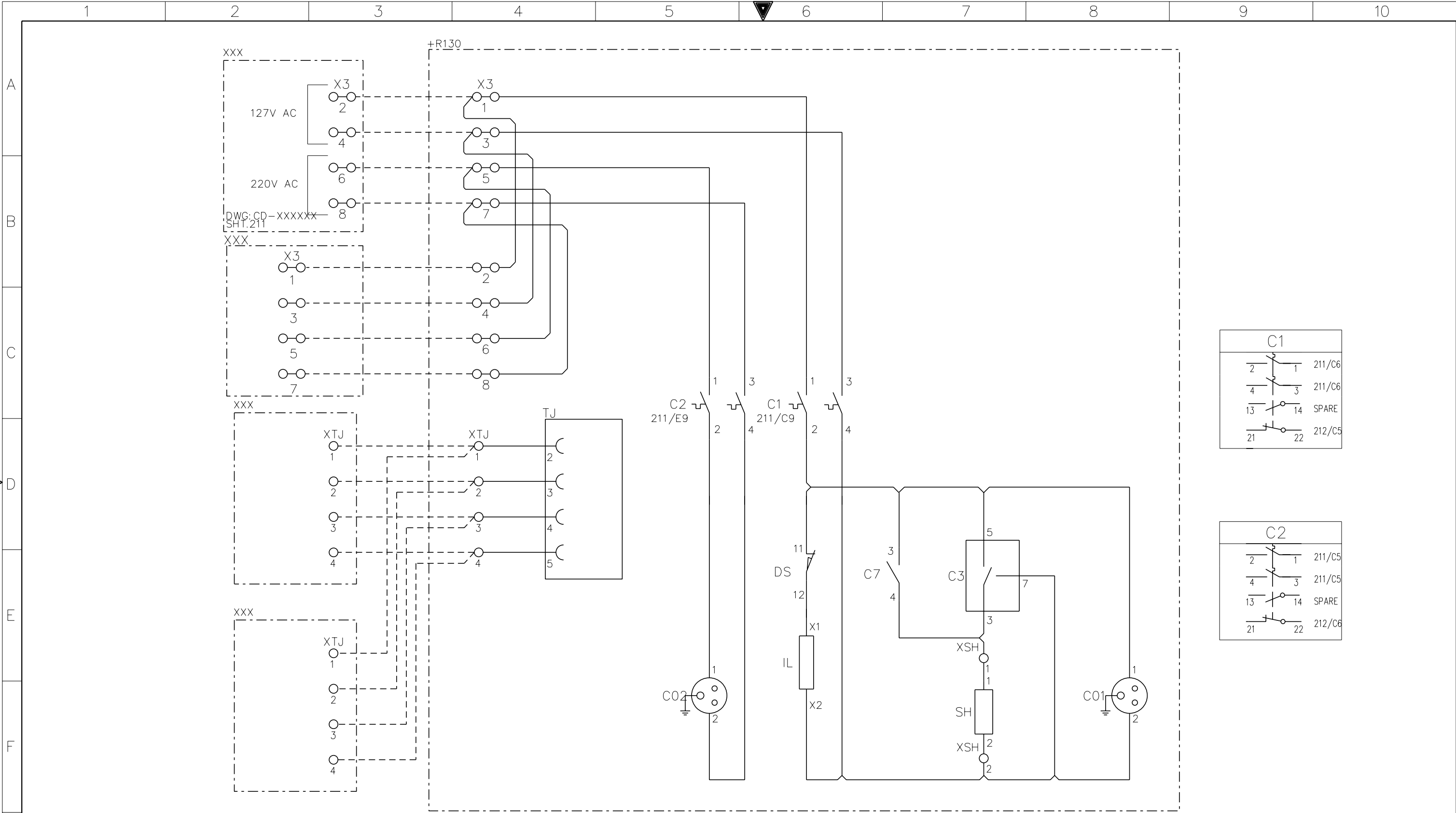
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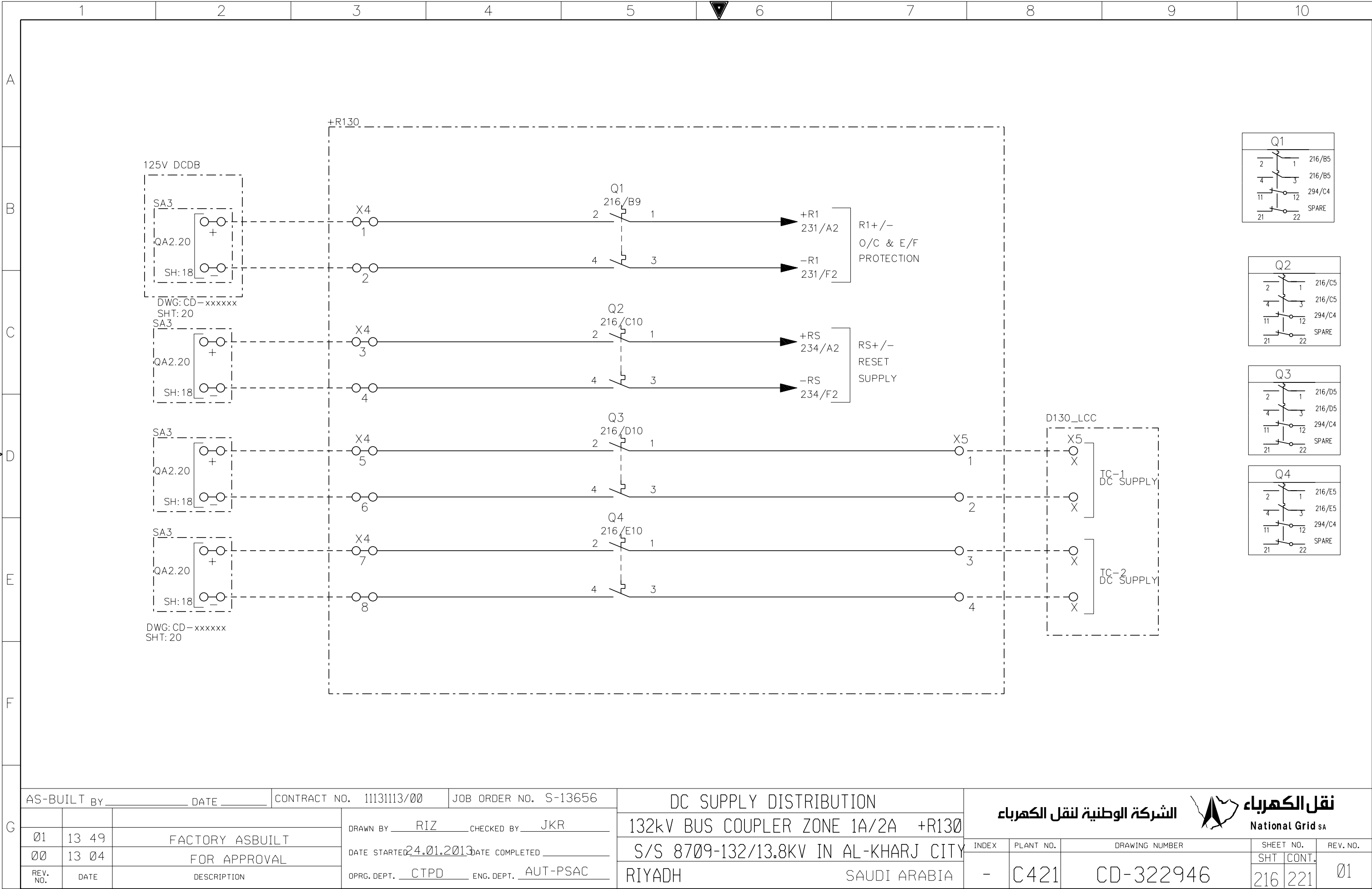
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		AC SUPPLY FOR ILLUMINATION & POWER SOCKET		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>						
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132kv BUS COUPLER ZONE 1A/2A +R130		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
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	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		-	C421	CD-322946		211	212	01

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AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

DC SUPPLY DISTRIBUTION

132kV BUS COUPLER ZONE 1A/2A +R130

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



National Grid sa

REV. NO. DATE DESCRIPTION

01 13 49 FACTORY ASBUILT

00 13 04 FOR APPROVAL

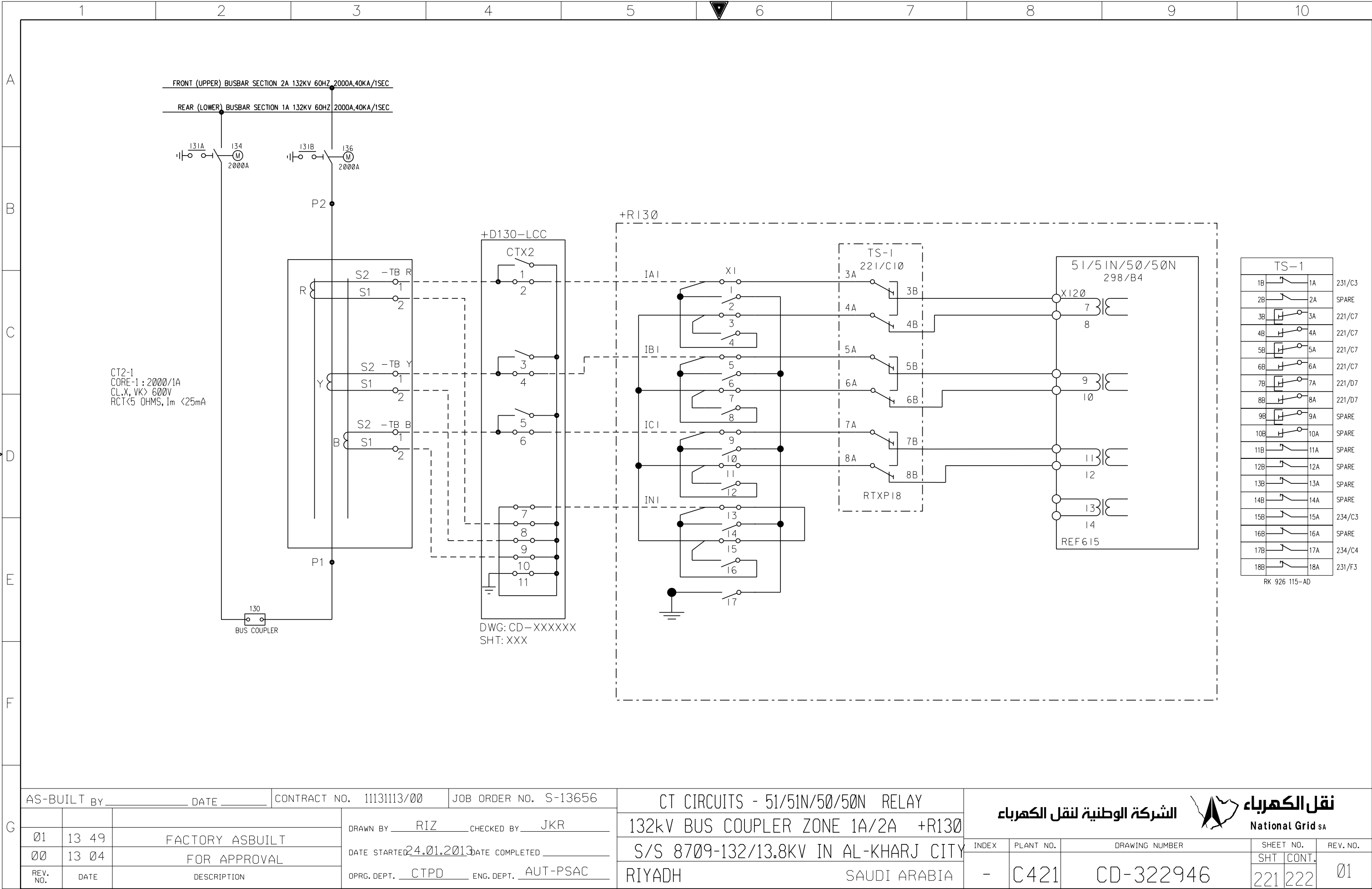
DRAWN BY RIZ CHECKED BY JKR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.

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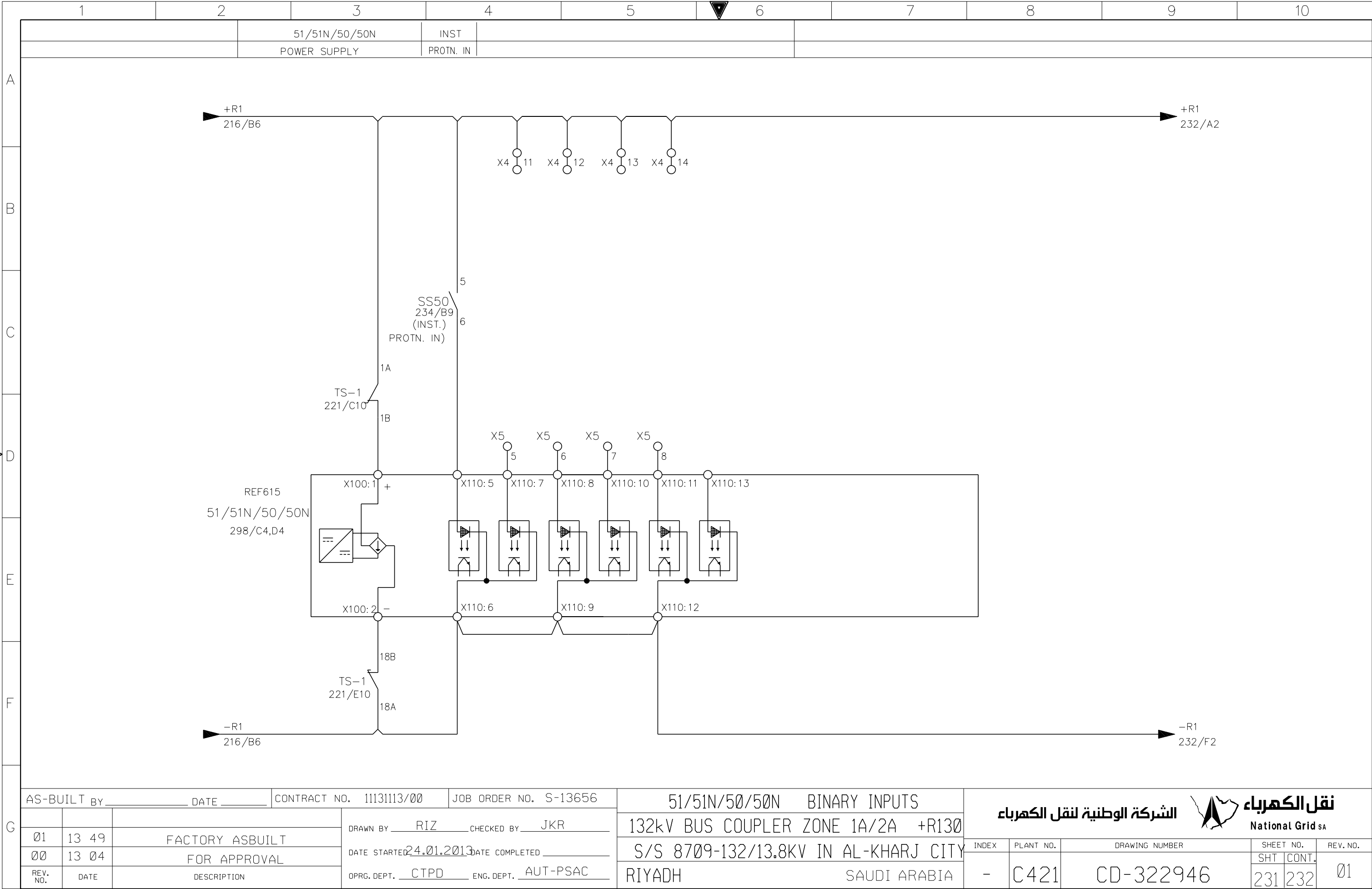


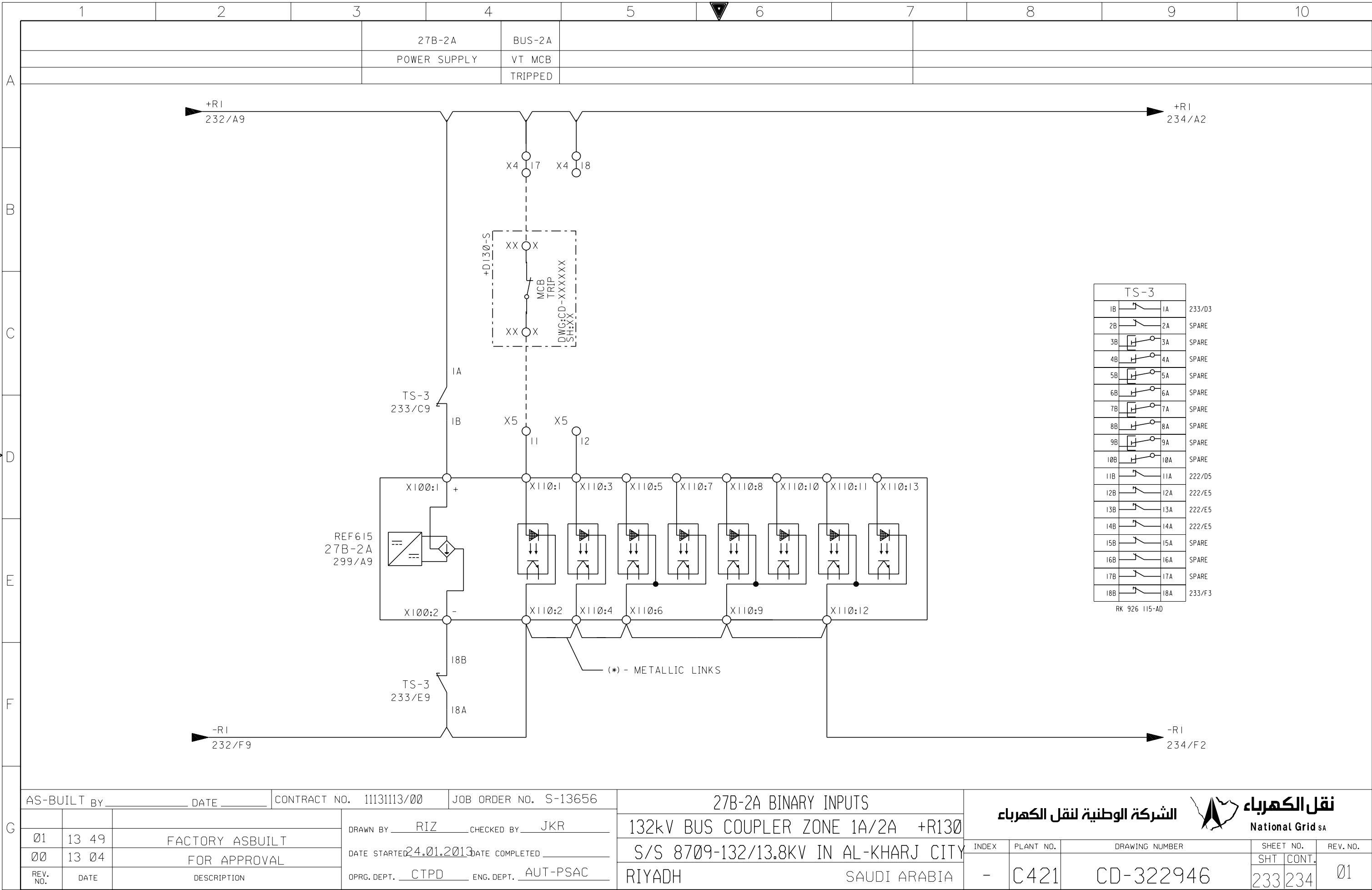
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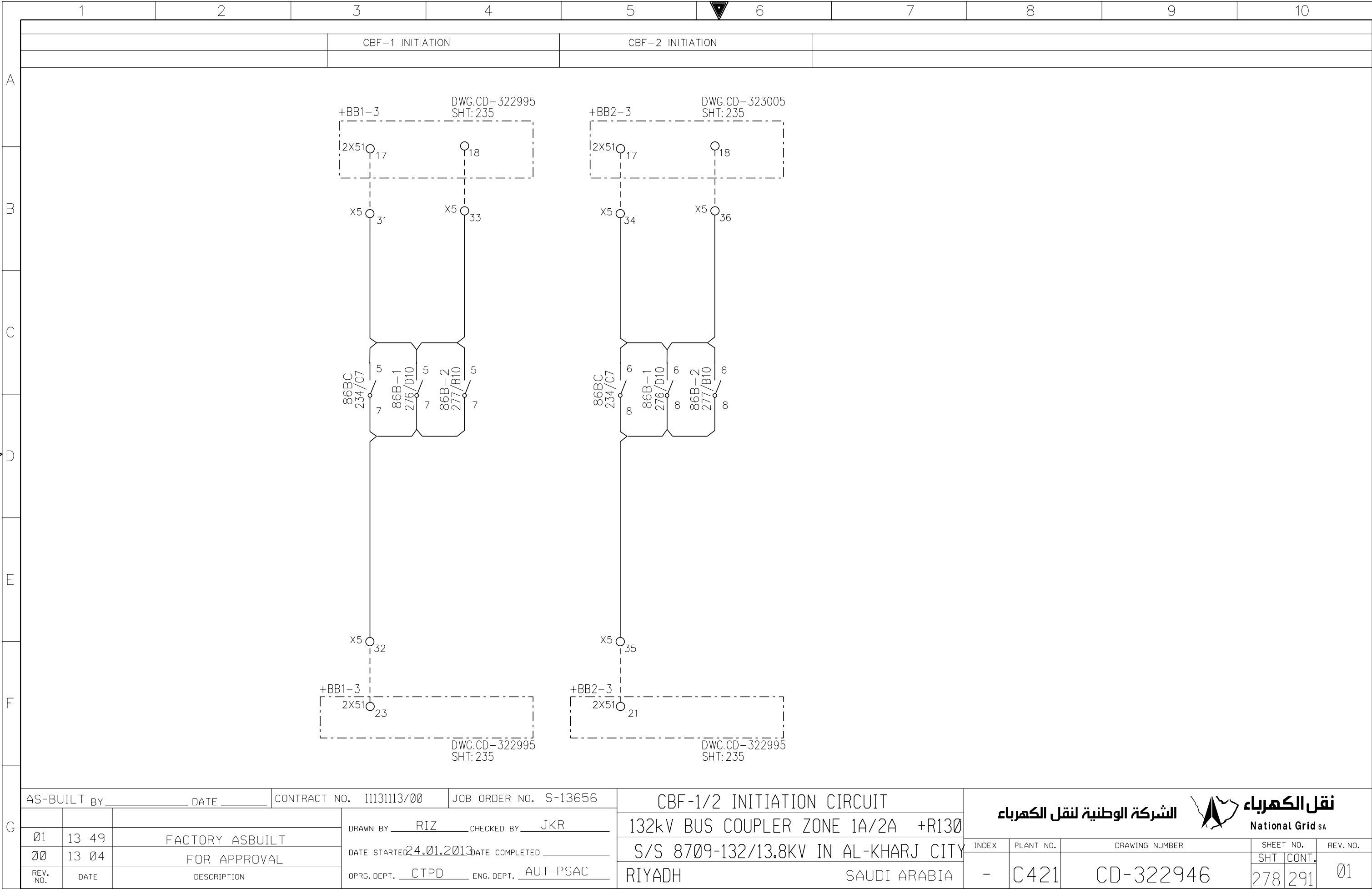
CT CIRCUITS - 51/51N/50/50N RELAY
132kV BUS COUPLER ZONE 1A/2A +R130
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

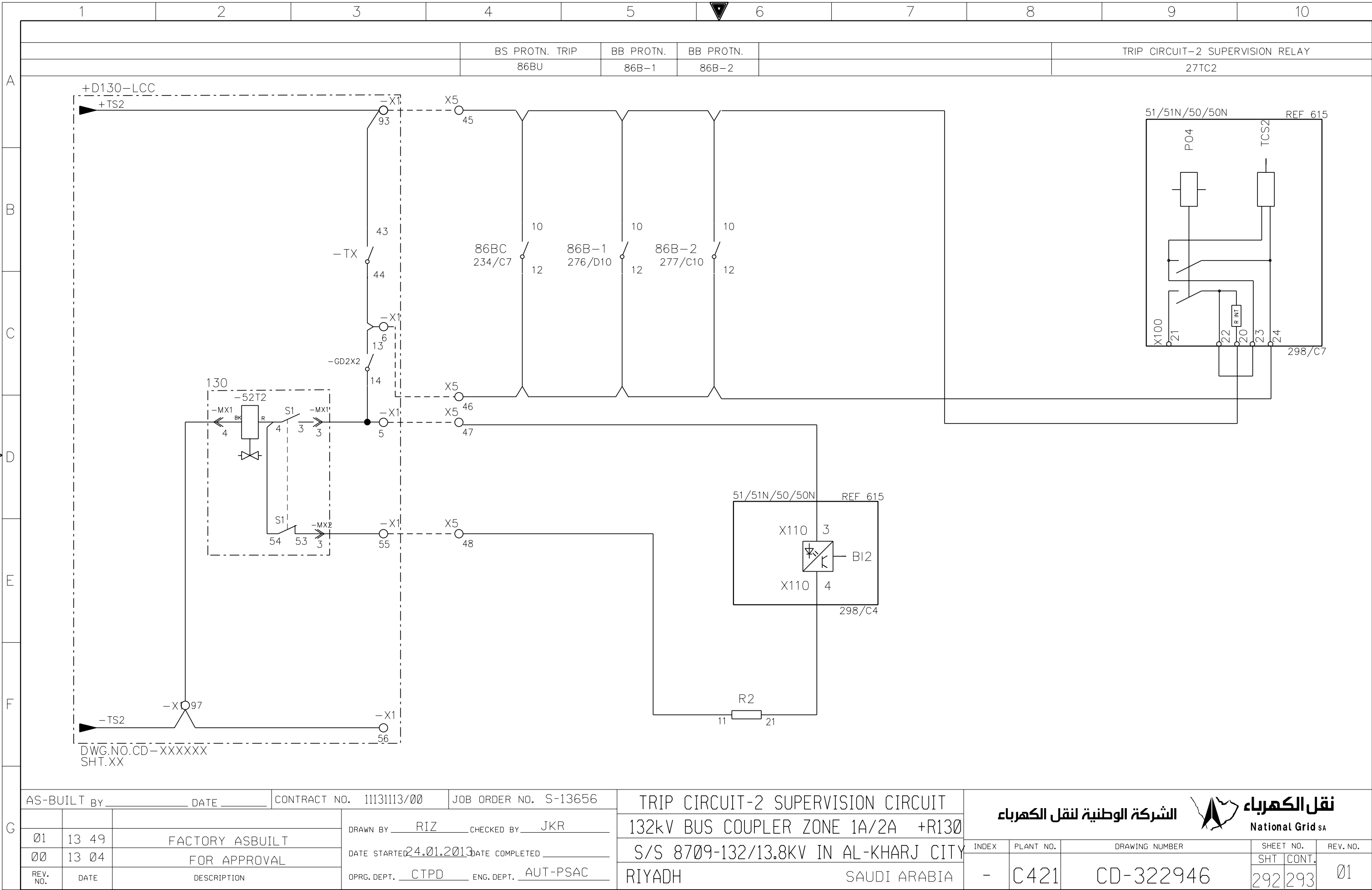
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C421	CD-322946		SHT	CONT.	01
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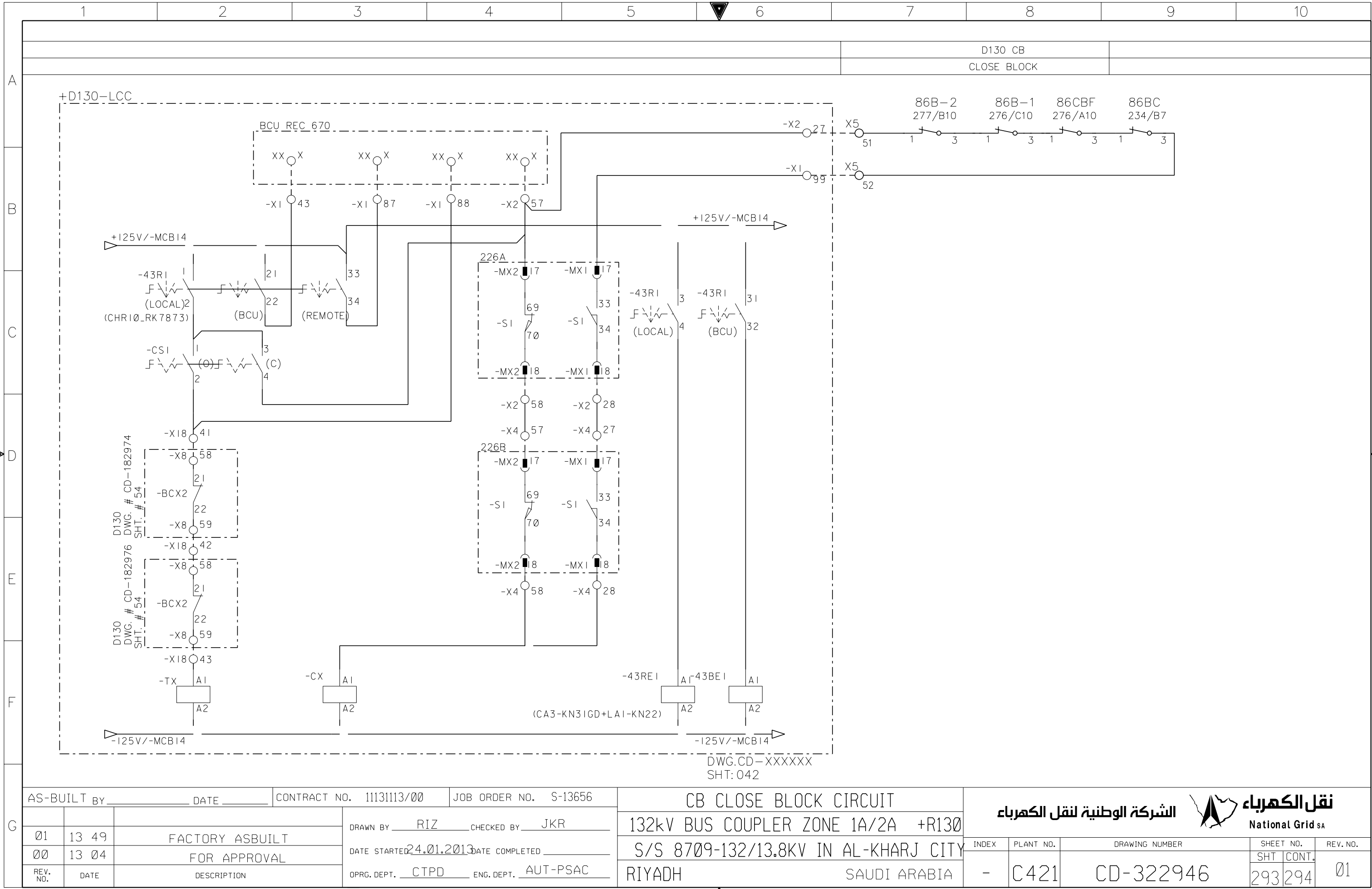


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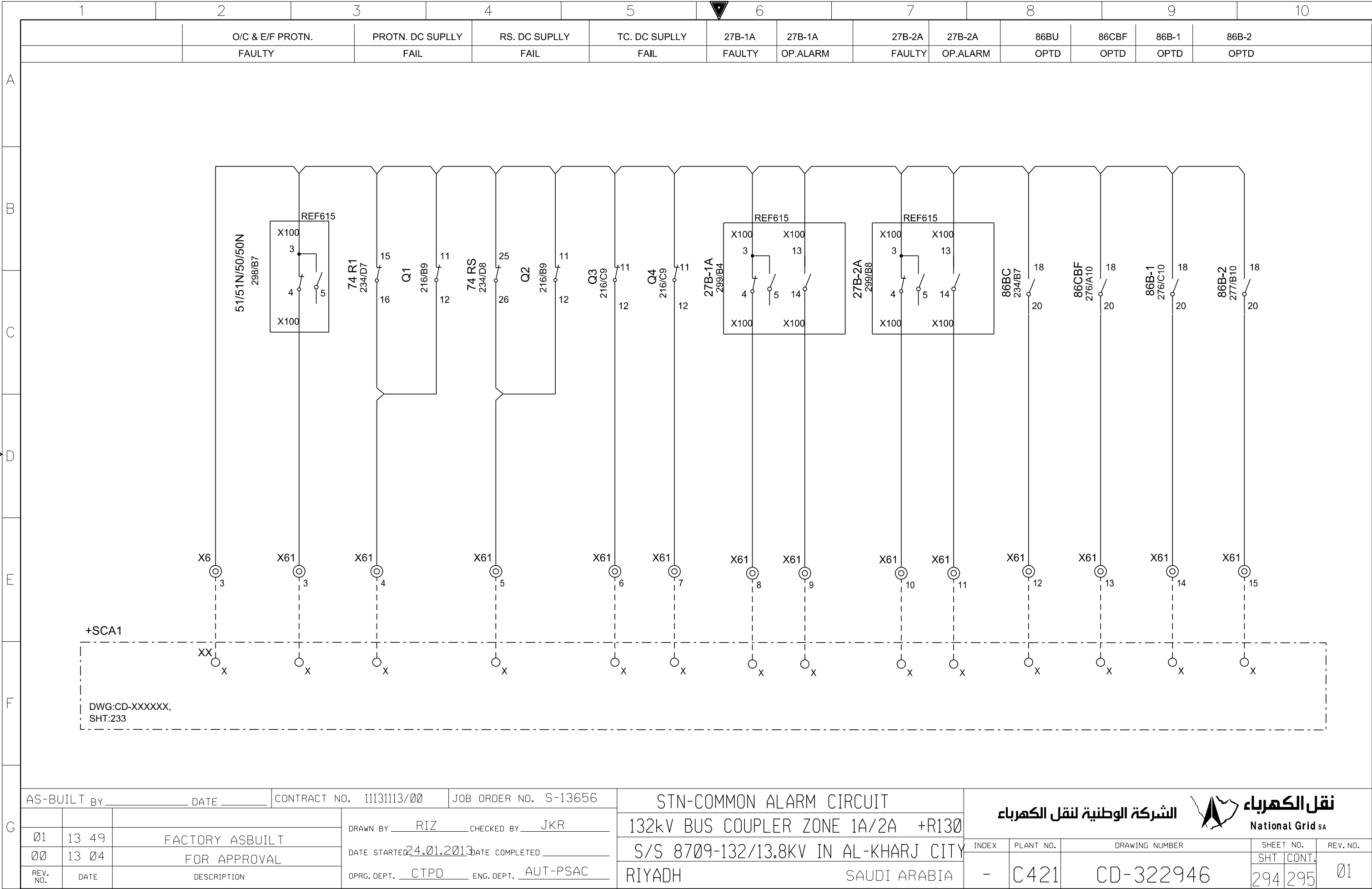
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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>			
01	13 49	FACTORY ASBUILT	DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____			
00	13 04	FOR APPROVAL	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>			
REV. NO.	DATE	DESCRIPTION				

CB CLOSE BLOCK CIRCUIT	
132kV BUS COUPLER ZONE 1A/2A +R130	
S/S 8709-132/13.8KV IN AL-KHARJ CITY	
RIYADH SAUDI ARABIA	

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.	
-	C421	CD-322946	SHT 293	CONT. 294	01



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00			JOB ORDER NO. S-13656			STN-COMMON ALARM CIRCUIT			<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>						
01	13	49	FACTORY ASBUILT			DRAWN BY RIZ CHECKED BY JKR			132kV BUS COUPLER ZONE 1A/2A +R130									
00	13	04	FOR APPROVAL			DATE STARTED 24.01.2013 DATE COMPLETED _____			S/S 8709-132/13.8KV IN AL-KHARJ CITY			INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
REV. NO.	DATE		DESCRIPTION			OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC			RIYADH SAUDI ARABIA							SHT	CONT.	
												-	C421	CD-322946		294	295	01

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CKT.</td></tr><tr><td>222/B6</td><td>1</td></tr><tr><td>222/B6</td><td>2</td></tr><tr><td>222/B6</td><td>3</td></tr><tr><td>222/B6</td><td>4</td></tr><tr><td>222/D6</td><td>5</td></tr><tr><td>222/E6</td><td>6</td></tr><tr><td>222/E6</td><td>7</td></tr><tr><td>SPARE</td><td>9</td></tr><tr><td>SPARE</td><td>10</td></tr></table>	REFERENCE	X2 VT CKT.	222/B6	1	222/B6	2	222/B6	3	222/B6	4	222/D6	5	222/E6	6	222/E6	7	SPARE	9	SPARE	10	<table><tr><td>INTERNAL REFERENCE</td><td>X4 DC CKTS.</td></tr><tr><td>216/B3</td><td>1</td></tr><tr><td>216/B3</td><td>2</td></tr><tr><td>231/B4</td><td>3</td></tr><tr><td>231/B4</td><td>4</td></tr><tr><td>231/B5</td><td>5</td></tr><tr><td>231/B5</td><td>6</td></tr><tr><td>232/B4</td><td>7</td></tr><tr><td>232/B5</td><td>8</td></tr><tr><td>232/B5</td><td>9</td></tr><tr><td>232/B5</td><td>10</td></tr><tr><td>233/B4</td><td>11</td></tr><tr><td>233/B5</td><td>12</td></tr><tr><td>233/B5</td><td>13</td></tr><tr><td>233/B5</td><td>14</td></tr><tr><td>SPARE</td><td>15</td></tr><tr><td>SPARE</td><td>16</td></tr><tr><td>SPARE</td><td>17</td></tr><tr><td>SPARE</td><td>18</td></tr><tr><td>SPARE</td><td>19</td></tr><tr><td>SPARE</td><td>20</td></tr></table>	INTERNAL REFERENCE	X4 DC CKTS.	216/B3	1	216/B3	2	231/B4	3	231/B4	4	231/B5	5	231/B5	6	232/B4	7	232/B5	8	232/B5	9	232/B5	10	233/B4	11	233/B5	12	233/B5	13	233/B5	14	SPARE	15	SPARE	16	SPARE	17	SPARE	18	SPARE	19	SPARE	20	<table><tr><td>INTERNAL REFERENCE</td><td>X5 CONTROL & PROTN.</td></tr><tr><td>231/D4</td><td>1</td></tr><tr><td>231/D4</td><td>2</td></tr><tr><td>231/D5</td><td>3</td></tr><tr><td>231/D5</td><td>4</td></tr><tr><td>232/D4</td><td>5</td></tr><tr><td>232/D4</td><td>6</td></tr><tr><td>232/D5</td><td>7</td></tr><tr><td>232/D5</td><td>8</td></tr><tr><td>233/D4</td><td>9</td></tr><tr><td>233/D4</td><td>10</td></tr><tr><td>233/D5</td><td>11</td></tr><tr><td>233/D5</td><td>12</td></tr><tr><td>SPARE</td><td>13</td></tr><tr><td>SPARE</td><td>14</td></tr><tr><td>276/A2</td><td>15</td></tr><tr><td>276/F2</td><td>16</td></tr><tr><td>276/A7</td><td>17</td></tr><tr><td>276/F7</td><td>18</td></tr><tr><td>276/A2</td><td>19</td></tr><tr><td>276/E2</td><td>20</td></tr><tr><td>276/A4</td><td>21</td></tr><tr><td>276/E4</td><td>22</td></tr><tr><td>276/A5</td><td>23</td></tr><tr><td>276/E5</td><td>24</td></tr><tr><td>277/A4</td><td>25</td></tr><tr><td>277/F4</td><td>26</td></tr><tr><td>277/A7</td><td>27</td></tr><tr><td>277/F7</td><td>28</td></tr><tr><td>277/A5</td><td>29</td></tr><tr><td>278/B3</td><td>30</td></tr><tr><td>278/E3</td><td>31</td></tr><tr><td>278/B4</td><td>32</td></tr><tr><td>278/B5</td><td>33</td></tr><tr><td>278/F5</td><td>34</td></tr><tr><td>278/B6</td><td>35</td></tr><tr><td>SPARE</td><td>36</td></tr><tr><td>SPARE</td><td>37</td></tr><tr><td>291/A3</td><td>38</td></tr><tr><td>291/C3</td><td>39</td></tr><tr><td></td><td>40</td></tr></table>	INTERNAL REFERENCE	X5 CONTROL & PROTN.	231/D4	1	231/D4	2	231/D5	3	231/D5	4	232/D4	5	232/D4	6	232/D5	7	232/D5	8	233/D4	9	233/D4	10	233/D5	11	233/D5	12	SPARE	13	SPARE	14	276/A2	15	276/F2	16	276/A7	17	276/F7	18	276/A2	19	276/E2	20	276/A4	21	276/E4	22	276/A5	23	276/E5	24	277/A4	25	277/F4	26	277/A7	27	277/F7	28	277/A5	29	278/B3	30	278/E3	31	278/B4	32	278/B5	33	278/F5	34	278/B6	35	SPARE	36	SPARE	37	291/A3	38	291/C3	39		40	<table><tr><td>INTERNAL REFERENCE</td><td>X5 CONTROL & PROTN.</td></tr><tr><td>291/D3</td><td>41</td></tr><tr><td>291/E3</td><td>42</td></tr><tr><td>291/F5</td><td>43</td></tr><tr><td>291/F6</td><td>44</td></tr><tr><td>292/A4</td><td>45</td></tr><tr><td>292/C4</td><td>46</td></tr><tr><td>292/D4</td><td>47</td></tr><tr><td>292/E4</td><td>48</td></tr><tr><td>292/F6</td><td>49</td></tr><tr><td>292/F6</td><td>50</td></tr><tr><td>293/A7</td><td>51</td></tr><tr><td>293/A7</td><td>52</td></tr><tr><td>SPARE</td><td>53</td></tr><tr><td>SPARE</td><td>54</td></tr><tr><td>SPARE</td><td>55</td></tr><tr><td>SPARE</td><td>56</td></tr><tr><td>SPARE</td><td>57</td></tr><tr><td>SPARE</td><td>58</td></tr><tr><td>SPARE</td><td>59</td></tr><tr><td>SPARE</td><td>60</td></tr></table>	INTERNAL REFERENCE	X5 CONTROL & PROTN.	291/D3	41	291/E3	42	291/F5	43	291/F6	44	292/A4	45	292/C4	46	292/D4	47	292/E4	48	292/F6	49	292/F6	50	293/A7	51	293/A7	52	SPARE	53	SPARE	54	SPARE	55	SPARE	56	SPARE	57	SPARE	58	SPARE	59	SPARE	60	<table><tr><td>REFERENCE</td><td>X9 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